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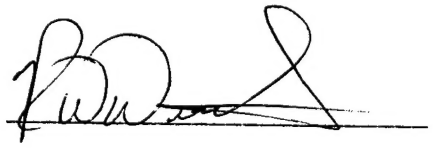
Airborne C2 and the Operational Commander: A Framework for Effective Utilization

by

Richard W. Weathers
Lieutenant Commander, U.S. Navy

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: 

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Doctrine regarding the proper utilization of airborne C2 is unclear in specifics, but clear in tone; C2 is the exclusive province of the ACC (Air Component Commander and AOC (Air Operations Center) with subordinate air asset providers and directors relegated to the role of awaiting the daily arrival of the Air Tasking Order (ATO) and carrying out the instructions contained therein. This situation not only makes inadequate utilization of all components of the air C2 architecture, but dangerously concentrates the C2 potential of air operations at a single level and location.

Doctrinal changes which direct the ACC/AOC to share C2 functions with subordinate levels of the C2 architecture (including airborne C2) should be made and exercised to improve the dispersion of C2 in air operations.

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Abstract of

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Command and control of air operations has long been a source of contention among the services. Air Force philosophy has frequently been at odds with that of the Navy and Army. In the years following Desert Storm, significant progress has been made in thrashing out communications difficulties and service representation problems. Solutions, however, have created new problems; among these, the overcentralization of command and control in air operations and a willingness to discard the significant capabilities of subordinate C2 nodes including airborne C2.

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The Contribution of Airborne Command and Control to Air Operations

Operation Desert Storm was unquestionably the most ambitious air operation conducted in the history of warfare. For 43 days (not including the massive airlift required to simply move US/Allied forces into theater), the ACC (Air Component Commander) was responsible for planning and coordinating more than 2400 sorties every day. One aviator commented that on the first night of air operations he was not much worried that the Iraqis might launch a counter offensive - any aircraft attempting to proceed south across the Saudi border would have physically run into an allied plane headed north.

Such a massive operation is not run on a shoestring. A mountain of planning is required and the task of controlling that volume of air traffic, even absent "the fog of war," is a daunting one. This is why so much energy and thought have been devoted in the post Desert Storm years to the development of Command and Control mechanisms and doctrine to address deficiencies observed during Desert Storm. Clarity of command and control (C2) relationships is recognized to be crucial to the success of joint air operations by contributing directly to fundamental principles of war:

> "Fundamental principles and doctrine for the command and control of joint air operations ensure unity of effort for the benefit of the joint force as a whole."[1]

The use of aircraft in most aspects of modern warfare is accepted by all practitioners of operational art, and aircraft have a significant presence in modern air warfare C2 functions. What is the contribution of airborne command and control to the air operation? Have these platforms outlived their usefulness?

Operational Requirements for Airborne Command and Control

The fundamental principle that evolved into the requirement for airborne

command and control platforms actually predates the airplane itself. Operational commanders dating to Gaius Marius recognized the need to seize the highest ground available for his command post in order to see the battle unfold and direct the deployment of forces and commitment of reserves. The utilization of aircraft to provide the operational commander with this vision of the battlefield is, in its most fundamental sense, little more than an extension of this principle. The utility of airborne command and control platforms in this role was (and is) so compelling that every service has driven a stake into the ground and claimed some capability in this arena. The EC-130 ABCCC (Airborne Command Control and Communications) and E-8 JSTARS (Joint Surveillance, Targeting and Attack Radar System - affectionately known as "J-WACS), although technically assets belonging to the Air Force, are tied closely to the Army in their role of supporting ground operations. The E-2C HAWKEYE is the Navy's C2 platform and is a key element in control of carrier aircraft in missions ranging from Area Defense to Deep Interdiction Strike. The most widely recognized and capable of the airborne C2 systems is the Air Force E-3 AWACS, with radar coverage in excess of 350 nautical miles and a sophisticated communications suite. AWACS is also capable of deploying with an ACE (Air Combat Element) for the purpose of acting as a surrogate for the operational commander if required. Because of its stand-alone capabilities, AWACS is often the first platform deployed to a theater and is capable of coordinating air operations well in advance of the arrival of conventional C2 nodes (e.g. the Air Operations Center or Air Control Authority).[3]

These platforms provide a crucial capability for the operational commander; they allow him to "see" the battlefield (by means of a computer to computer datalink)

from a perspective that enables him to make quick, informed decisions regarding commitment of forces. This capability is equally important for the Air, Ground and Naval Component Commanders. But are manned C2 aircraft necessary for this capability? We can now deploy UAVs (Unmanned Aerial Vehicles) deep into enemy territory to pass much of the same information gained from expensive and vulnerable airborne command and control platforms. In an extensive analysis of the capabilities and future of a variety of airborne C2 platforms, James Medeiros notes:

> "Fleets of large airborne surveillance/C4I systems have become increasingly expensive to obtain and maintain. The problem is exacerbated by the ever broader array of sensor systems available, the operational demand for their products and the diminishing fleet of prospective platforms. The training and maintenance of the specialized systems and their mission crews are also becoming prohibitively expensive. Upgrading and modernizing embedded, integrated systems is also difficult and expensive."[3]

By contrast, UAVs (or UCAVs, denoting "combat") are relatively inexpensive and expendable. Though it is true no UAV has yet to match the combination of radar and communications capability of an AWACS or HAWKEYE, there are no apparent technological barriers to the development of such a capability.

If the only mission of these platforms was to provide the operational commander with a bird's eye view of the battlefield, there would be no valid counterpoint. Airborne C2, however, provides another uniquely valuable service to the operational commander. An echelon of control below the operational level is required to adequately coordinate the missions of tactical air assets for several important reasons. First, there have traditionally been constraints on the size/capacity of ground based air operations centers. In a complex, large-scale air operation, the AOC would be totally

saturated with control tasks absent a buffer capable of making decisions regarding departure, arrival, synchronization, rendezvous and the myriad of other minute to minute decisions required. Second, airborne C2 has often been the only element of the air control system physically capable of communicating with tactical aircraft conducting missions hundreds of miles from the AOC. Threat warnings and instructions are, of necessity, provided by airborne C2, as there is no other entity in the operating area capable of providing that information or making those decisions in a timely manner.

The State of Doctrine

Before discussing how the doctrine of air operations addresses the employment of airborne C2, it would be useful to clarify some terms. Command and control, for example, though frequently used as a compound word, actually delineates two *levels* of authority not two distinct concepts. Joint Pub 1-02 defines *Command* as

> "the authority that a commander in the Armed Forces lawfully exercises over subordinates by virtue of rank of assignment. Command includes the authority and responsibility for effectively using available resources and for planning the employment of, organizing, directing, coordinating, and controlling military forces for the accomplishment of assigned missions."

Control is defined by the same document as:

> "authority which may be less than full command exercised by a commander over part of the activities of subordinate or other organizations."

In air operations (particularly joint air operations), then, it may be useful to imagine the level of authority exercised at the ACC level as *command*, and authority exercised at subordinate levels as *control*. This means that the ACC may command an operation

and subordinate echelons including AWACS, the Carrier Airwing Commander or Air Force Wing Commander may (or at least should) exercise appropriate control over elements of that operation which are in their cognizance. And, although the mantra "centralized planning, decentralized execution" appears repeatedly in doctrine statements, these terms are so vague as to defy definition (as evidenced by their conspicuous absence from the appendices of Joint Pub 3-56.1, Command and Control for Joint Air Operations). Planning occurs at all echelons of air operations, from the Air Component Commander to the F-15 pilot conducting his element brief. Execution is merely the carrying out of a plan, which also occurs at all levels of command. It is more accurate (though less rhetorically engaging) to state that planning in an air operation is hierarchical; the plans of subordinates achieve unity of effort by using as their basis the plans of their seniors. In no way is planning "centralized." Execution (which also occurs at all levels) achieves unity of effort *in action* because planning has been conducted at all levels in harmony, not because it has been centralized. Terry Pudas notes:

> "Even though planning must always be *coordinated*, overall planning responsibility for specific operations should be vested in commanders responsible for execution. *The responsibility for planning and execution must not be separated.*" [emphasis mine] [4]

And, just as planning and execution are functions which are and must be decentralized, command and control must be decentralized as well, in order for those subordinates to effectively execute plans. It is here we first encounter problems with doctrine.

Command and control of air operations is becoming dangerously concentrated

with the ACC (Air Component Commander) and AOC. Subordinate C2 elements (including but not limited to airborne C2) are increasingly being cut out of command and control functions. In a recent CSAR (Combat Search and Rescue) exercise in the Adriatic, E-2C crews were frustrated by the micro-management of the rescue by personnel in the RCC (Rescue Coordination Center), hundreds of miles from the position of the downed airman and with only a datalinked picture for reference. One mission commander noted:

> "The belief that SATCOM and modern data links allow CSAR to be run and managed completely from ground combat information centers or war rooms is ineffective and unwise. Training, clear doctrine and plans, and a proactive Airborne Mission Commander . . . are the best [ways] of fighting the command and control adversaries of time and uncertainty."[5]

Air Force AWACS crewmembers are similarly concerned with proposals from some general officers for directly controlling air operations in Saudi Arabia from an AOC located at Shaw AFB; as one officer noted, "the theater commander has access to more real-time information than ever before, and wants to exercise direct control over the assets that 'belong to him.'"

The Control Gap

On the surface, it seems unreasonable to argue that better access to real-time information by operational commander is a bad thing, but that may in fact be the case.

> "It might be assumed that modern communications and computers always quicken response time. But they can in fact slow down command and control times if the commander is overloaded with a torrent of information."[6]

And yet, the response of planners tasked with designing the C2 architecture for the next Desert Storm or Provide Comfort is to build a bigger conduit so that ever

increasing amounts of data can flow into the operational commander's headquarters.

The first consequence of this desire for the operational commander (the ACC in this case) to achieve information nirvana is increasing lethargy and rigidity in the planning process. The ATO (Air Tasking Order) is currently planned 72 hours in advance of operations and is plodding toward the goal of tasking <u>every</u> sortie in theater.

> "The trend today is for tighter control of air in the theater of operations, with the requirement to place more and more sorties on the ATO . . . Currently, in Atlantic Fleet's predeployment JTFEX (FLEETEX), JFACC is required to show all flights (to include direct support helicopter logistic flights) on the ATO. At least one very senior Air Force commander has postulated that the next 'Desert Storm's' ATO will incorporate all helicopter sorties in the joint operations area (JOA). Understandably, this poses a tremendous challenge and adds emphasis for the need to create a fully interactive CTAPS [Contingency Tactical Air Control System Automated Planning System]."[7]

Note that the solution to the "challenge" is to improve the technology, not to question the validity of the requirement. The 72 hour ATO cycle (which shows some signs of expanding)[8] is so inflexible for scheduling air assets, which during Desert Storm, Navy Air Wing Commanders sometimes simply ignored tasking (Fleet Air Defense (FAD) sorties and local logistics flights for example), and scheduled sorties based on local requirements and within the restrictions of cyclic operations.+ The Army also recognizes the limitations of this system, which has driven them to fight (successfully) for control of ABCCC. One writer notes,

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+ It is worth noting that the standard ATO was on a 36-hour scheduling timeline in 1989, just two years prior to Desert Storm, and contained almost none of the excruciating detail found in today's document. Those who would argue that a 96-hour ATO is unthinkable are paying little attention to trends.

> ". . . a fast paced, ground scheme of maneuver would bog down under ACC's centralized air force control system, counter-battery efforts would suffer, and timely interdiction of ground forces could go unfilled in preference to long term, strategic bombing efforts."[9]

A second consequence to the overcentralization of the planning and control process is the creation of a C2 gap in air operations at the tactical/operational level. The vicious cycle which is fed by exploding communications technology runs something like this: improved communications gear and increased data rates enable controllers at the AOC and planners at the ACC staff to exercise increased control over tactical assets. The technology has limits, however, and operational level planners/controllers are dissatisfied with the lack of perfect control. The call goes out for increased data rates and faster processors. This (temporarily) improves the ability of operational level staffs to plan and control, but has also raised expectations. Perfect control has not been achieved. And the call for better and faster gear goes out again. Ultimately, all (or practically all) control of air operations from the tactical level up to the operational level would be drawn to the ACC/AOC. Although this is undoubtedly a worst case scenario, real-world indications are already evident. Deployment of an ACE with AWACS crews is not considered a high priority in any theater, as the AOC is presumed to be capable of handling tactical as well as operational control of aircraft. Air Force and Navy Wing commanders are relegated to the role of asset providers with little direct input into planning or control of "their" aircraft.

Third, the tendency toward centralization of the C2 architecture unnecessarily creates a critical vulnerability. One of the premises of Command and Control Warfare (C2W) is that striking at the heart of the enemy's C2 organization and decapitating it is

the most effective way of sowing confusion in the enemy's battle plan and operating inside his C2 cycle. Unfortunately, centralization of C2 at the AOC/ACC level simplifies the task for the enemy.

> "For those who would point to the allied successes in Desert Storm as reason to believe all is well with Air Force tactical command and control, the author cautions that U.S. and allied C3I, although greatly stressed during the conflict, *was never attacked.* In less than a week, Iraqi command and control equipment had been reduced to rubble, and shortly thereafter, Saddam Hussein's war machine had been rendered ineffective. Responsible Air Force leadership cannot afford to overlook these lessons."[10]

Finally, overcentralization will inevitably lead to an atrophy in the capabilities of subordinate C2 echelons, in particular, airborne C2. Already there is some evidence of this. In Desert Storm, for example,

> ". . . ACE personnel were in short number, and from the existing pool of personnel, the ones with any actual experience on the E-3 were even more rare. Many didn't understand their role in the big picture, and mistakenly thought they were responsible for employing the E-3, instead of serving as an extension of the theater/component commander."[11]

Unfortunately, the predictable response to this shortcoming has focused on improving the capability of AWACS to transmit data so as to make the availability or relative competency of an ACE irrelevant.

Recommendations

There is no turning back the tide of technology, and it is not my intention to suggest that we should. Improved communications and rapid data processing can serve the ACC, and should not have to mean the loss of an evenly structured C2 architecture. But realism and respect for the chaos of war must be reflected in the development of our C2 systems as well as in training.

First, ACE components must be better trained. In testimony following the shoot-down of two Blackhawk helicopters during Operation Provide Comfort, the ACE commander's understanding of AWACS systems was so abysmal, he could not make sense of the displays on which he was to base decisions; his own description of his poor grasp of the technology was that he felt "like a pig looking at a watch""[12] Interestingly, part of the reason he was exonerated was that the board of inquiry did not expect him to have such expertise. ACEs must have a clear understanding of their responsibility to control air operations and be technically trained to do so.

Second, ACE components should be deployed in more platforms. Currently ACEs are deployed only in the E-3 AWACS although ABCCC and JSTARS both have the capability to deploy an ACE component. Due to crew size limitations and lesser on-station times, the E-2C Hawkeye will not have the same capabilities, but should be able to function as an ACE in many situations (particularly in MOOTW). The deployment of ACEs in a variety of platforms will bolster training by providing ready employment for personnel trained as ACE commanders to gain experience.

Third, doctrine must clarify the C2 philosophy of the US Armed Forces as it pertains to air operations. One author notes,

> "Instead of bringing order to JFACC, JCS Publication 3-01.2 provided guidance which frustrated attempts to improve it. In a given contingency, the CINC would determine the exact responsibilities of the JFACC, decide to what degree the JFACC would be involved in detailed planning and tasking, and decide which service component would execute the JFACC function. With these crucial decisions being made on a case-by-case basis, there was little impetus for the service components to coordinate joint procedures or to procure the command and control means necessary to perform an undefined situational joint function."[13]

Air Force guidance comes close, but still does not make it all the way:

> "During day-to-day operations, the ACE will function as if communications have been lost, and the ACE assumes the CCO (Chief of Combat Operations) role. *However, any decisions that create a deviation from the ATO must be coordinated with the J3 through the AOC before actions are taken.*"[14] [Emphasis mine]

General doctrine as well as specific exercise and operational guidance should specify the roles airborne C2 will play, and that role should be substantial. The notion that "the AOC can do it" does not justify allowing this resource to atrophy.

Fourth, serious attention should be given to the utilization of mission type orders instead of task orders in appropriate situations. As already alluded to, there is little need for every sortie flown in theater to be planned three days in advance at the operational level by the ACC. This type of micro-management breeds contempt for the process at best, and at worst, docile compliance and squelching of initiative. Winnefeld and Johnson make a clear comparison of the competing philosophies:

> "A mission type order is an order issued to a lower unit that includes the accomplishment of the total mission assigned to the higher headquarters or (as in the case cited here) one issued to a unit that calls for performance of a mission without specifying how it is to be accomplished. A task order provides details - when, how and with what. The ATO was by definition a task order."[15]

ACC planners should limit specific tasking to those missions which directly impact operational objectives. Most of the remainder of air operations required in the theater can be tasked as missions within certain geographic constraints. For example, air defense of western Saudi Arabia and protection of the air corridors over the Red Sea from potential Iraqi air attacks could have been simply assigned as a mission to the Red Sea Carrier Task Group Commander. There would be no requirement to assign specific aircraft, launch times, fuel and weapons requirements, etc. in the ATO. Simply

assign the mission and let the subordinate C2 echelons work out the details. The argument in vogue against this sort of decentralized control has been that deconfliction of missions in the theater of operations demands centralized control and specific tasking of every asset in theater. While the concern for conflict between missions up to and including the potential for "blue on blue" engagements is a valid one, its resolution certainly does not demand that every aircraft flight be scheduled in the ATO. As former Air Force Chief of Staff General Merrill McPeak pointed out, common procedures and reliable tactical control will resolve most mission conflicts. Airborne C2 platforms provide the necessary seam between operational level C2 which is held at the AOC level and tactical execution. The ACC should be free to focus his planning efforts and ATO tasking on sorties which impact operational objectives like planning the next series of deep interdiction strikes and not the tanker tracks for the next three days.

Conclusions

"The fact that, historically speaking, those armies have been most successful which did not turn their troops into automatons, did not attempt to control everything from the top, and allowed subordinate commanders considerable latitude has been abundantly demonstrated."[16] Martin Van Creveld's analysis is as striking today as ever. And perhaps he would be disturbed by the growing centralization of Command and Control in Air Operations. Doctrine which should serve to clarify these issues and work against human tendencies to micro-manage tactical execution is far too vague and contradictory to be an effective guide, and in many cases drives the operational commander toward increased centralization. Airborne C2 offers a way to spread the

C2 potential of air operations more evenly over the entire command structure and improve the survivability, flexibility and reaction time of of US forces in Joint Air Operations.

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